

NOTES

REDISCOVERY OF *HEMIZONIA MOHAVENSIS* (ASTERACEAE) AND ADDITION OF TWO NEW LOCALITIES.—Andrew C. Sanders, Herbarium, Dept. of Botany and Plant Sciences, University of California, Riverside, CA 92521, and Darin L. Banks and Steve Boyd, Herbarium, Rancho Santa Ana Botanic Garden, 1500 N. College Ave., Claremont, CA 91711.

Hemizonia mohavensis Keck is a rare plant endemic to southern California, historically known from three collections made between 1924 and 1933, but not reported since. It has been widely thought extinct (e.g., Skinner & Pavlik, C.N.P.S. Inventory of Rare and Endangered Vascular Plants of California, 5th ed., 1994; Keil in Hickman, ed., The Jepson Manual: Higher Plants of California, University of California Press, 1993). The type locality is the Mojave River near Deep Creek (Keck, Madroño 3:4–18, 1935) at the north foot of the San Bernardino Mountains, San Bernardino County, but repeated searches in that area over the past 20 years have failed to find the plant. The locality reported for the earliest collection, San Jacinto Mountains in Riverside County, has been questioned (Skinner & Pavlik 1994) because the habitat cited, “chaparral hillside”, was so different from the type locality and because the few searches conducted failed to find the species. The range of the species, “s SnBr”, given in *The Jepson Manual* (Hickman 1993) is incorrect; it is not known from the south side of the San Bernardino Mountains.

Rediscovery and Known Distribution. In January 1994, Sanders and associates rediscovered *Hemizonia mohavensis* along both Twin Pines Creek and Brown Creek on the north slope of the San Jacinto Mountains. These collections were compared to an isotype and to two other specimens housed at RSA to confirm identification. Later it was discovered that the UCR Herbarium held two post-1933 collections of *H. mohavensis* from the San Jacinto Mountains, both misidentified as *H. kelloggii* E. Greene, and that these were from locations other than Twin Pines and Brown creeks—Hwy 243 at Lawlor Lodge and near Poppet Flat. Subsequent searches in fall of 1994 revealed additional populations farther up Twin Pines Creek, but failed to rediscover the Lawlor Lodge and Poppet Flat populations. The total population in fall 1994 in the Twin Pines Creek drainage was estimated at ca. 6000 plants. A search in fall of 1995 by J. Hirshberg, employed by the U. S. Forest Service, revealed additional populations in the Poppet Flat area and another site in the Twin Pines Creek drainage.

In October 1995, Banks and Boyd discovered the species in the Palomar Mountains of northern San Diego County. A series of sizable populations was found in Cutca Valley and adjacent areas of the Long Creek drainage. The total meta-population here was conservatively estimated at 10,000 individuals in the fall of 1995, but could easily have been several times larger. Based on the habitat at the Palomar site (ancient erosional surface with relatively gentle relief, granitic substrate, and desert transition chaparral vegetation), we conducted surveys in comparable areas of the Anza Bench to the northeast. Within this region, we discovered a series of populations in the vicinity of Indian Flats and in Chihuahu Valley, north of Warner Springs, San Diego County. The species was not encountered in the nearby areas of Riverside County, such as Tule Valley and Anza Valley, however.

The distribution of *Hemizonia mohavensis* appears to be highly discontinuous. Although it may be locally common where it occurs, it is limited to only a few very restricted habitat patches. All known populations occur between 850 and 1600 m elevation, but with most between 915 and 1225 m. The Lawlor Lodge site (1600 m) is highly anomalous in that the area is densely wooded with pines and oaks and there are no moist openings. The specimen was collected on the roadside (G. Helmkamp,

personal communication), which is the only open habitat present, and it appears to have been a waif. The area was thoroughly searched in fall of 1994, and no sign of the species was found.

The San Bernardino Mountains population of *Hemizonia mohavensis* remains enigmatic. Extensive searching in the vicinity of the type locality in 1994 and 1995 failed to locate the species. We believe that the type plants were waifs washed from an unknown population in vernal wet areas above. The type locality has been modified by construction of the Mojave River Forks Dam and upstream the Mojave River is flooded by Silverwood Lake. Possibly *H. mohavensis* occupied the area now under the lake. Although there appears to be potential habitat on the Las Flores Ranch, that area is private property and access has not been available. Many other areas in the San Bernardino Mountains have now been searched that do not appear to support the species. Areas surveyed in 1994 and 1995 that do not appear to support the species include Miller Cyn., West Fork Mojave River southwest of Silverwood Lake, margins of Silverwood Lake, Deep Creek from the Mojave River Forks Dam to Devil's Hole, Grass Valley at the crossing of Hwy 173 and upstream at the Pacific Crest Tr. (PCT), upper Horsethief Creek near the PCT, Horsethief Creek at Hwy 173, below the Mojave River Forks Dam on the Mojave River, Mojave River at the road crossing just southwest of Mojave River Forks Dam, Hwy 173 in the Las Flores Ranch area, Pilot Rock Ridge, and Hwy 173 from Mojave River Forks to Lake Arrowhead, notably along Kinley Creek.

Habitat preferences and biology. *Hemizonia mohavensis* occurs on gentle slopes and low gradient stretches of streams in otherwise mountainous terrain. It is generally found in grassy swales, at seeps, and along intermittent creeks in clay, silty, or gravelly soils which are saturated early in the year. Occasional plants may be found in drier sites near occupied wet areas, but these are always dwarfed. Surrounding slopes generally support xeric chaparral characterized by *Adenostoma fasciculatum* Hook. & Arn., *A. sparsifolium* Torrey, *Ceanothus greggii* A. Gray ssp. *perplexans* (Trel.) Jepson, and *Arctostaphylos glauca* Lindley. Streamside benches and open valley floors often support sizable stands of *Quercus agrifolia* Nee.

Hemizonia mohavensis seems to prefer areas where water accumulates and is available at depth through the summer. In this regard, the micro-habitat seems similar to that of other rare southern California *Hemizonia* species such as *H. arida* Keck and *H. floribunda* A. Gray, which also inhabit low moist areas, and rather dissimilar to that of such common species as *H. kelloggii* and *H. fasciculata* (DC.) Torrey & A. Gray, which inhabit dry fields, grasslands, and open slopes.

Flowering begins in July and continues through the fall and sometimes into winter if cold weather does not kill the plants. For example, when the initial rediscovery was made (1 January 1994), most plants were in fruit, and many were clearly decadent. Nevertheless, there were a fair number of individuals that still possessed a few open flowers, and a very few still heavily in flower.

The most recent floras covering southern California (e.g., Munz, A Flora of Southern California, University of California Press, 1974; Hickman 1993) state that the disk flowers of *H. mohavensis* are staminate and produce no fertile achenes. In fact, fertile disk achenes are present in most capitula, but may not be apparent in immature specimens. This discrepancy doesn't affect identification using the key in Hickman (1993), but might result in errors using Munz (1974).

Also, despite statements in the manuals (Hickman 1993; Munz 1974; Abrams & Ferris, An Illustrated Flora of the Pacific States, Stanford University Press, 1960) that *H. mohavensis* is 1.5 to 3 dm tall, it commonly reaches 1 m and sometimes 1.5 m. Plants under 3 dm are not uncommon, especially on habitat margins, but in good conditions the species will normally be taller. It appears the original collections were of relatively depauperate plants from marginal habitat or under drought conditions.

Conclusions. *Hemizonia mohavensis* still appears to be globally rare, but relatively stable, especially within the Cleveland National Forest. The currently known distribution (Fig. 1) suggests it is principally a Peninsular Range species, rather than one

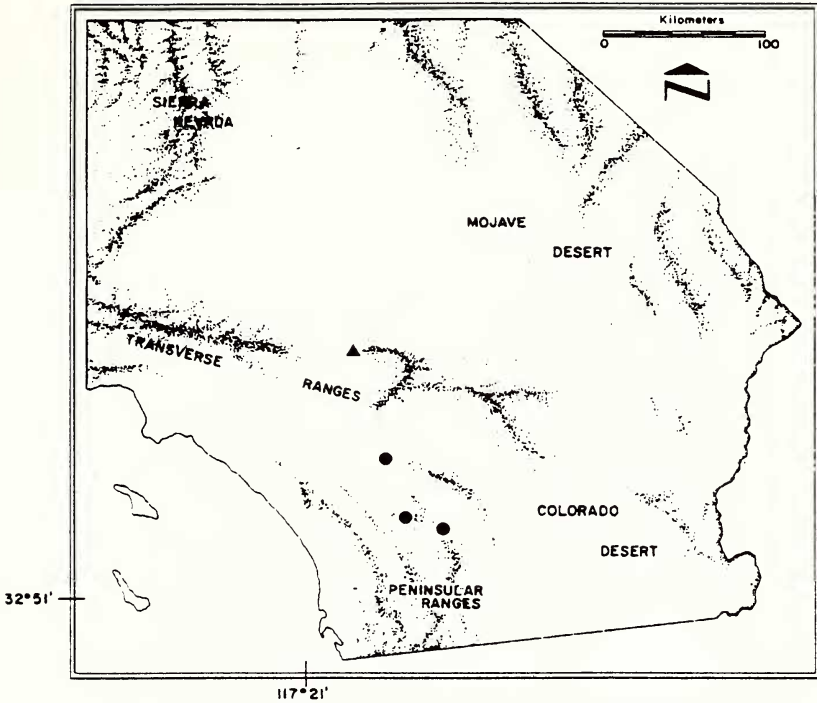


FIG. 1. Map of southern California showing approximate locations of known occurrences of *Hemizonia mohavensis*. Extant meta-populations are indicated by closed circles. The type locality (presumed extirpated) is indicated by a closed triangle.

of the Transverse Ranges or Mojave Desert margin as previously thought. With the better delimitation of habitat that we now have, it may be possible to find additional populations. Even within areas of generally suitable habitat, however, populations tend to be highly restricted, so very focused searches will be needed if additional sites are to be found.

Specimens examined. The following is a summary of all collections of *Hemizonia mohavensis* known to us.

California, Riverside County (all San Jacinto Mtns.): Banning-Idyllwild Rd., 3100 ft, 29 July 1924, *P. A. Munz & I. M. Johnston* 8880 (POM); Hwy 243, 1.6 km SE of Poppet Flat Rd, 4500 ft, 2 Oct 1977, *W. W. Mayhew s.n.* (UCR); Hwy 243 near Lawlor Lodge, 3.3 km N of Pine Cove, yellow pine and oak forest, 1600 m, 7 Oct 1989, *G. K. Helmkamp s.n.* (UCR); Brown Cr., Twin Pines Cr. drainage, 116°47'W, 33°53'N, T3S R2E S/2 NE/4 S29, hillside seep, 3120 ft, 1 Jan 1994, *A. C. Sanders* 14224 (RSA, UC, UCR); Brown Cr., 0.5 km above Twin Pines Cr., 116°47.5'W, 33°53'N, T3S R2E NE/4 S29, sandy bed of creek, 2920 ft, 4 Oct 1994, *A. C. Sanders, T. Schram & D. Wappler* 15771 (UCR); Twin Pines Cr. near Brown Cr., 116°48'W, 33°53'N, T3S R2E NW/4 S29, 856 m, sand along dry creek, 4 Oct 1994, *A. C. Sanders, T. Schram & D. Wappler* 15769 (UCR); 1.6 km SE of Twin Pines Ranch along draws between Pine Cr. and Dutch Cr., 116°47'W, 33°51.5'N, T4S R2E NW/4 NE/4 S4, formerly wet, grassy openings in chaparral, 1198 m, 6 Oct 1994, *A. C. Sanders, T. Schram & D. Wappler* 15793 (UCR); gorge of Azalea Cr., Twin Pines Cr. drainage, 116°48'W, 33°51.5'N, T4S R2E NW/4 NW/4 S5, low mead-

owy bench on creek bottom, 6 Oct 1994, A. C. Sanders, T. Schram & D. Wappler 15783 (UCR); Azalea Cr. and tributary gully from west, 116°48'W, 33°52'N, T3S R2E SW/4 SW/4 S32, formerly wet soil, 6 Oct 1994, A. C. Sanders, T. Schram & D. Wappler 15780 (UCR); Azalea Cr. 1 km SW of Twin Pines Ranch buildings, road crossing just outside fence, 116°48'W, 33°52'N, T3S R2E NW/4 SE/4 S32, 1070 m, sand along creek, 4 Oct 1994, A. C. Sanders, T. Schram & D. Wappler 15774 (UCR); tributary of Azalea Cr. 1.6 km due S of Twin Pines Ranch, 116°47.5'W, 33°51'N, T4S R2E center NE/4 S5, 1130 m, 4 Oct 1994, A. C. Sanders, T. Schram & D. Wappler 15775 (UCR); Brown Cr., 0.5 km above Twin Pines Cr., 116°47.5'W, 33°53'N, T3S R2E NE/4 S29, 915 m, 4 Oct 1994, A. C. Sanders, T. Schram & D. Wappler 15772 (UCR); S of Twin Pines Rd just W of Twin Pines Ranch entrance, 116°48'W, 33°52'N, T3S R2E SE/4 NW/4 S32, wash on canyon bottom, 6 Oct 1994, A. C. Sanders, T. Schram & D. Wappler 15789 (UCR); Twin Pines Ranch Rd, drainage 1 km NW of Twin Pines Ranch, T3S R2E NW/4 S32, 1100 m, 13 Sep 1995, J. Hirshberg *s.n.* (UCR); seeps and drainages along road to Hungry Hollow from Hwy 243, 1.6 km E of Poppet Flat, T4S R1E NW/4 S1, 1225 m, 13 Sep 1995, J. Hirshberg *s.n.* (UCR). **San Bernardino County:** Mojave River just below confluence with Deep Cr., low sand bars in the river bed, not more than ten plants found, 17 Sept. 1933, D. D. Keck 2531 (Holotype: UC; Isotype: RSA!); Mojave River at Deep Creek, 3000 ft, dry sandy river bed, 18 July 1933, L. C. Wheeler 1961 (RSA). **San Diego County:** NW of Hot Spring Mtn., Chihuahua Valley, 0.3 km S of Chihuahua Valley Rd on 9S05, open mesic swale in chaparral, T9S R3E NW/4 SE/4 S17, 1270 m, 7 Dec 1995, D. L. Banks & A. Sanders 0858 (RSA); 4.2 km S of Chihuahua Valley Rd on 9S05, open mesic swale in chaparral, T9S R3E NE/4 SW/4 S21, 1200 m, 7 Dec 1995, D. L. Banks & A. Sanders 0859 (RSA); (the following all Cleveland Nat. Forest); NW Palomar Mtns., Agua Tibia Mtns., Cutca Tr., Cutca Valley, 1 km outside the Agua Tibia Wilderness, at Cutca Rd (8S08), T9S R1E SW/4 NE/4 S18, 33°23'45"N 116°55'15"W, 3460 ft, 27 Oct 1995, D. L. Banks & S. Boyd 0853 (RSA); Cutca Tr., E of Cutca V., 0.3 km from Aguanga Tr., first major drainage, T9S R1E NW/4 NE/4 S16, 33°23'33"N 116°52'27"W, 3480 ft, 2 Nov 1995, D. L. Banks, *et al.* 0854 (RSA); Cutca Tr., 1 km W of Aguanga Tr., T9S R1E SE/4 NW/4 S16, 33°24'41"N 116°52'40"W, 3480 ft, 2 Nov 1995, D. L. Banks, *et al.* 0855 (RSA); Cutca Tr., 1.3 km W of Aguanga Tr., T9S R1E SE/4 NW/4 S16, 33°23'37"N 116°53'41"W, 3520 ft, 2 Nov 1995, D. L. Banks, *et al.* 0857 (RSA); hills N of Warner Springs and S of Chihuahua Valley, W of Hot Springs Mtn., Indian Flats Rd (9S05), 8 km N of Highway 79, T9S R3E S/2 SE/4 S35, ca. 3900 ft, 18 Nov 1995, S. Boyd 8529 (RSA); Indian Flats Rd, stream crossing 9.1 km N of Hwy 79, T9S R3E center S35, 3820 ft, 18 Nov 1995, S. Boyd 8530 (RSA); Indian Flats Rd, entrance to Indian Flats campground, T9S R3E SE/4 SE/4 S21, 3640 ft, 18 Nov 1995, S. Boyd 8531 (RSA); Indian Flats Rd, 14 km N of Hwy 79, T9S R3E NE/4 NE/4 S34, 3850 ft, 18 Nov 1995, S. Boyd 8532 (RSA).

DITTRICHIA GRAVEOLENS (ASTERACEAE), NEW TO THE CALIFORNIA WEED FLORA.—Robert E. Preston, Jones & Stokes Associates, 2600 V Street, Suite 100, Sacramento, CA 95818.

In November of 1994, I came across a nondescript composite that resembled a weedy member of the Aster tribe, while I was conducting a biological survey of the Alviso Marina in San Jose. Upon inspecting the plants, I found them to be of an unfamiliar species and collected specimens for later determination. I could not key them out using *The Jepson Manual* (Keil in Hickman (ed.), *The Jepson Manual: Higher Plants of California*, 1993), and I was ultimately unable to key them out using other North American manuals. Turning to the international floras, I found the plants to key out readily to *Dittrichia graveolens* (L.) Greuter in the Flora of New South